

NOTES ON THE ACARINE GENUS *OPHIOPTES*, WITH A DESCRIPTION OF A NEW AUSTRALIAN SPECIES

By R. V. SOUTHCOTT

[Read 13 Oct. 1955]

SUMMARY

Mites of the genus *Ophioptes* Sambon 1928 are ectoparasites of Colubrid snakes, in whose scales they form pits. Three South American and one Asian species have been described hitherto. *Ophioptes samboni* n. sp. is described, parasitic upon the Colubrid snake *Rhynchoelaps fasciolatus* (Günther 1872) from north Queensland; it is nearest to *O. coluber* Radford 1947, from India. A key to the known species is provided, and the homologies of the genus are discussed. The genus is removed from the family Myobiidae to a new family Ophioptidae.

INTRODUCTION

In 1928 Sambon described *Ophioptes parkeri* as a new genus and species of mite, parasitic upon the banded Colubrid snake *Erythrolamprus aesculapii* (L.), from Buenavista, Bolivia. This mite caused pits in the scales of the host. Sambon described two stages in the life history of the mite, and placed it in the family Cheyletidae, where it occupied an anomalous position. Sambon commented, however, upon certain characters more suggestive of affinities with the Sarcoptiformes than with the Prostigmata of the Trombidiformes. Sambon added a further note about further specimens of the genus received at the time of going to press, and allotted some of these to a further species *O. oulemansi* Sambon 1928, which he characterized briefly, but without figures. Although he promised to describe these further mites in a subsequent paper on the "Ophidian Mites," apparently this intention was not realized by the time of his death in August, 1931.

In 1933, Ewing described a further species—*O. tropicalis* Ewing 1933, from the Colubrid snake *Erpetodryas carinatus* (L.), from British Guiana. Like Sambon's species, it also produced pits in the scales of its host.

In 1947, Radford described a further species, *O. coluber*, from the "copper-headed rat-snake (*Coluber radiatus* Schlegel)" from Imphal, Manipur State, India. As with the preceding authors, he allotted the genus to the family Cheyletidae. Thus there has been a total of four species described for *Ophioptes*, three from South America, and one from the mainland of Asia.

In the present paper a new species of the genus—*O. samboni* n. sp.—is described, an ectoparasite upon the banded Colubrid *Rhynchoelaps fasciolatus* (Günther 1872) from north Queensland. The opportunity is taken of studying the affinities of the genus.

OPHIOPTES SAMBONI n. sp.

Description of Adult (Figs. 1-3, 5, 7; Fig. 1 and the description are from specimen ACC193A; Fig. 2 is from specimen ACC193B; a third specimen, ACC193C, has also been compared): Body ellipsoidal, soft, transverse; width 425μ , length 345μ (425μ to front of capitulum). Integument soft, thin, not striated. Eyes absent. Dorsum with an anterior group of five stiff lanceolate spiniform setae in its anterior half, setae $16-28\mu$ long. A further group of four similar setae, smaller, $14-20\mu$ long, is situated at the posterior pole of the dorsum. All these dorsal setae are slightly "shouldered," as occurs in e.g. the dorsal setae of *Sarcoptes scabiei*.

The venter is strengthened by the epimera of the coxae. To each of the first three coxal areas there is a single spiniform seta, 16-20 μ long; a similar pair 16 μ long to the sternal area. There are two pairs of stout nautilus-like bosses or pegs, with a series of curved grooves, on the epimera of the second pair of coxae, 14 μ long by 10 μ wide (Figs. 2, 5) (nautalae). The anterior pair is situated immediately posterior to the pair of sternal setae. These "nautalae" resemble somewhat the dorsal "notothoracic spines" of e.g. *Sarcoptes scabiei* (Fig. 6); the latter are, however, without the series of groovings, and articulate with an extensive seta base.

The genitalia cannot be seen in much detail, but in all specimens a pair of labia meet in an inverted Y, immediately in front of the anus. No sign of the dorsal penis described by Sambon in *O. parkeri* can be found. Around the anogenital area is a series of short spiniform setae, arranged as figured, 12-18 μ long.

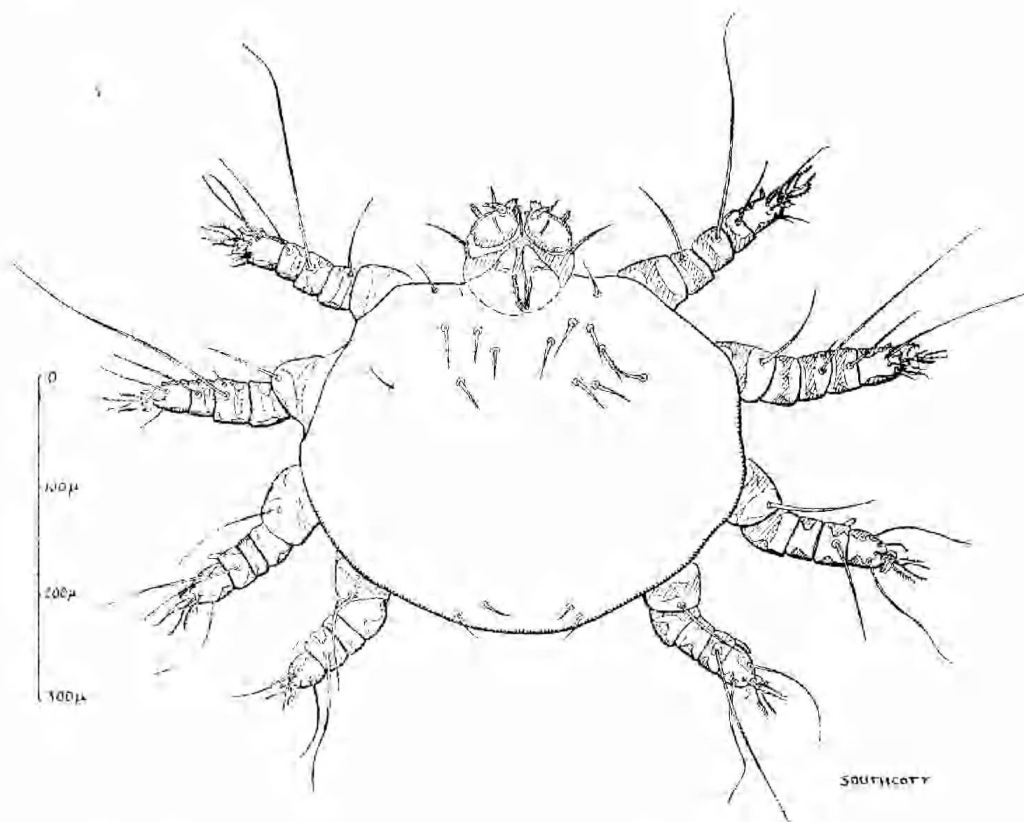
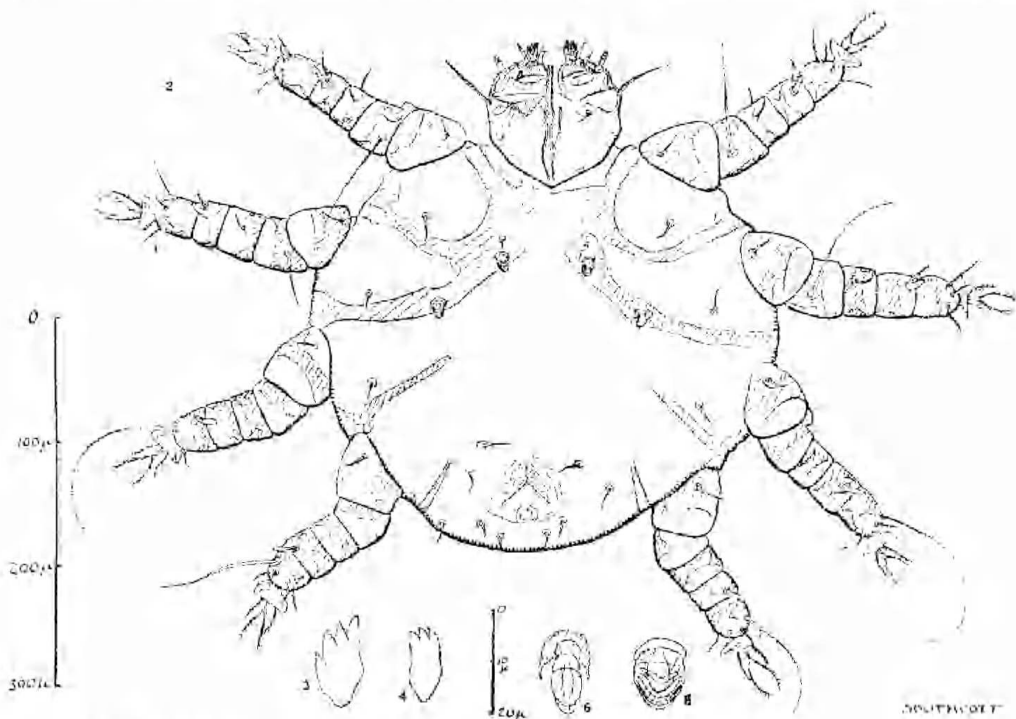


Fig. 1.—*Oplioptes samboni* n. sp., dorsal view, entire (specimen ACC 193A).

The legs are short and stout, with a weak integument, but are strengthened internally by chitinous sheets, which are much thicker than the integument. Each leg consists of six segments — coxa, trochanter, femur, genu, tibia, tarsus. The coxae are not clearly demarcated on the venter. The chaetotaxy of the legs is as follows:

Leg I: Trochanter with one short curved spiniform seta 20 μ long, on its ventral aspect. The femur has two long tapering setae, the anterodorsal the stouter, pointed, faintly ciliated with adnate ciliation, 72 μ long, the postero-ventral simple, whip-like, 60 μ long. Genu with a long, simple, whip-like seta 190 μ long, situated dorsally; ventrally a short spiniform seta 20 μ long, with a

few barbs; anteriorly a spiniform seta 18μ long. Tibia dorsally with a spiniform seta with adnate ciliations, 45μ long; ventrally with a blunted peg with one or two adnate ciliations, 16μ long by 6μ wide, and alongside this peg a spiniform seta with adnate ciliations, 30μ long. Tarsus dorsally with two rows of setae, a proximal and a distal; the proximal row of two setae—a striate expanded spindle-like peg 9μ long by 4μ wide (a modified solenidion or solenoidal seta = striate seta), situated anteriorly, and a spiniform seta 65μ long, slightly bent at the tip (this seta is duplicated on the left side); the distal dorsal row overhanging the sucker or caruncle, two of them falciform ("L-shaped"), with a single faint dorsal adnate ciliation, each 18μ long; the other two are conjugate, one striate, 26μ long, and posteriorly a smaller spiniform seta, 14μ long (this latter is duplicated on the left side). Ventrally a row of four setae, all spiniform, the anterior 30μ long, then two similar, each 11μ long, then one curved, 15μ long.



Figs. 2-6.—Figs 2-3 *Ophioptes samboui* n. sp.; Fig. 2, ventral view, entire (specimen ACC 193B), to scale on left; Fig. 3, apical tarsal seta of palp. Fig. 4, apical tarsal seta of palp of *O. coluber* Radford (from a paratype). Fig. 5, coxal spine or nodule of *O. samboui* n. sp. Fig. 6, lateral dorsal seta of an adult female *Sarcoptes scabiei* (DeGeer 1778). (Figs. 3-6 to scale shown.)

Leg II: Trochanter with a similar (as in 1) seta ventrally, 20μ long. Femur II as in Leg I, with anterodorsal seta 80μ long, posteroventral 80μ long. Genu as in I, with dorsal spiniform seta 235μ long, ventral spiniform seta 18μ long. Tibia: dorsal spiniform seta with lightly barbed ciliations, seta 60μ long; ventrally a thick peg 18μ long by 5μ wide, with adnate ciliations, and a spiniform seta with a few ciliations, 24μ long. Tarsus: setae as in Leg I.

Leg III: Trochanter dorsally with a long spiniform seta with faint adnate ciliations, 85μ long; ventrally a spiniform seta 21μ long. Femur and genu nude. Tibia dorsally with a long spiniform seta with adnate ciliations, 95μ long; ventrally a stout peg-like seta with adnate ciliations, tapering slightly, a little blunted, 21μ long by 5μ wide. Tarsus III dorsally with two long spiniform setae, curved, tapering and finally becoming filiform, 100μ long. There are no

solenoidal (striate) setae, but otherwise the chaetotaxy is the same as in tarsi I and II. There are two L-shaped (falciform) setae, and one short spine.

Leg IV: Chaetotaxy as in Leg III, the only difference being that the dorsal tibial seta is long, tapering, simple 165μ long.

The tarsus of each leg is provided apically with a peculiar modified empodium, but is without lateral claws. The empodium ("difurcula") is as described in other species of the genus—a fine dichotomous fork gives rise to a further similar structure at its forking. The pitchfork-like branches are delicately fringed, and taper gracefully to fine points. Each tarsus has a large cup-shaped sucker, as figured, typically Sarcoptoid in appearance. Presumably the empodium functions as a tactile organ, and aids the sucker (caruncle) below it.

The capitulum is stout, compact and broad. There has been considerable simplification of its structure, so that the interpretation of its segmentation is difficult. As in the legs, the segments of the palpi are strengthened internally by chitinous bands. An interpretation of the segmentation of the palpi is offered in Figure 7. On the ventral surface of the basis capituli is a pair of bristles, 14μ long, taken as the hypostomal setae. A strong external spine is present at the base of the palp laterally, 47μ long; this is interpreted as the femoral seta. A stout, blunt process, with adnate ciliations, 16μ long, placed anterolaterally upon the palp, is interpreted as the lateral tibial seta. A similar seta, slightly curved, 20μ long, placed dorsally toward the tip of the palp is considered as the dorsal tibial seta (or possibly the genual seta). The palpal genu and tibia are fused to a genotibia; at the apex of this there is a normal, slender bifurcate tibial claw, with the dorsal prong over-reaching the ventral. The palpal tarsus is also somewhat modified. Apically it bears a seta modified to a broad four-toothed process, roughly in the shape of a human foot, 16μ long by 10μ wide at its widest part (somewhat anteriorly) (see Fig. 3). The "toes" are stout and pointed, and point anteriorly and slightly upwards; the medianmost toe, like the hallux, extends furthest forwards. The palpal tarsus carries also two stout spiniform setae, the lateral 11μ long, the medial 20μ long.

The chelicerae are styliiform, and extend back within the body of the capitulum to form an elbow, and then recurve forwards to a point in about the middle of the substance of the capitulum.

Locality: Three specimens (ACCI93A, B, C) parasitic upon a banded Colubrid snake (*Rhynchocloaps fasciolatus* (Günther 1872)) (identified by E. W. Jensen), collected in the vicinity of Wondecla, North Queensland, received Sept. 1943, apparently collected a few months before, name of collector unknown (snake preserved in alcohol in the Regimental Aid Post of the 2nd/8th Australian Infantry Battalion).

The species is named in honour of L. W. Sambon, 1866-1931, who originally described the genus, and who was a noted epidemiologist.

The Systematic Position of Ophioptes samboni n. sp.

The following key is offered for the separation of the five species now allotted to the genus (based on the keys of Sambon, Ewing and Radford, the examination of *O. samboni* and a paratype of *O. coluber*).

- A Each tarsal sucker consisting of two divergent hollow pads
O. oudemansi Sambon 1928
- AA Each tarsus with a cup-shaped sucker (caruncle).
 - B On the dorsum, above legs 2, 3, and 4, situated peripherally, there is a long spiniform seta. Lateral tibial palpal seta clavate
O. parkeri Sambon 1928
 - BB No long setae laterally on the dorsum. Lateral tibial palpal seta tapering.

- C The anteromedian group of dorsal setae large and conspicuous; dorsal body setae near capitulum as long as the palpi *O. tropicalis* Ewing 1933
- CC Anteromedian group of dorsal setae shorter.
 - D A posterior dorsal group of 4 setae present. Solenoidal setae on tarsus I and II form spindle-shaped pegs. The foot-like seta at the apex of the palpal tarsus with 4 "toes" (Fig. 3) *O. samboni* n. sp.
 - DD Posterior dorsal group of 8 setae present (i.e. anus at posterior pole of body). Solenoidal setae on tarsus I and II form conical pegs. The foot-like seta on the palpal tarsus with three distinct "toes" (Fig. 4) *O. coluber* Radford

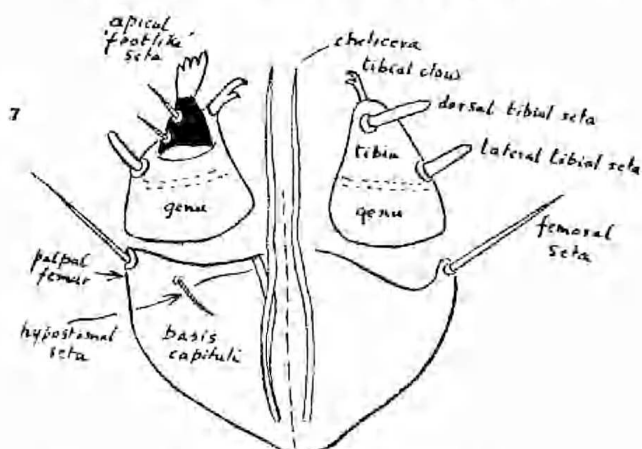


Fig. 7.—Suggested interpretation of the structure of the mouthparts in *Ophioptes*.

Ophioptes samboni n. sp. is considered closest to its nearest known neighbour geographically, *O. coluber* Radford, from Imphal, Manipur State, India. It is, however, not possible to make more complete comparisons with the other species. Furthermore, as none of the developmental stages of *O. samboni* were available, only the adult stages have been considered in this paper. In the adult of *O. parkeri*, apart from a reference to the anus, which is depicted in stipple, along with the anal setae, no figure or description of the ventral surface was offered by Sambon. Sambon mentioned the presence of cone-shaped spines (nautalae) upon the venter of *O. oudemansi*, and it is inferred that these are not present in *O. parkeri*. This latter would be surprising, as they have now been observed in each of the other species of the genus. It may also be well to mention here that what are called the coxa, trochanter, femur and tibia in the legs by Radford should properly be called trochanter, femur, genu and tibia. Although the actual term employed is arguable in the cases of the genu and tibia, this is not the case with the more proximal leg segments. The coxa is not a movable segment; Radford has missed the weakly defined coxae on the body, and called the first movable segment (trochanter) the coxa. Radford also states that the dorsum of *O. parkeri* bears long spines above legs i-iii; reference to Sambon's figure shows that this should read ii-iv.

Sambon described a dorsal genital orifice with a penis in his type adult specimen of *O. parkeri*, and took his specimen (?specimens) as male. This structure has not been observed subsequently in the genus by either Ewing, Radford or myself, and if the validity of Sambon's observations be accepted, all the specimens that have been described since have been females. It is not at present possible, therefore, to elucidate intraspecific sexual morphological

differences. However, Radford claims that the female sexual orifice is present in the anterior part of the dorsum in *O. coluber*, in the position in fact described by Sambon for the male sexual orifice. I have examined carefully a paratype specimen of *O. coluber*, in the collection of the South Australian Museum, and have been unable to find any trace of an aperture in the position described by Radford, nor is there one in any of the three specimens of *O. samboni*. The genitalia externally in this paratype of *O. coluber* are in fact as described above in *O. samboni*, but the anus is at the posterior pole of the body. Ewing (1933), in his account of the maturer instars of *O. tropicalis*, stated "Anus a longitudinal slit, in front of which is a bilobed fold, and in front of this fold a transverse sclerotized lip," and figures the perineum accordingly; this, with minor modification, agrees with the description and figure submitted here for *O. samboni*. It is conceivable that Radford had a male specimen before him, and not a female as he had postulated; however, the clarification of this problem must be left to the future.

THE AFFINITIES OF THE GENUS OPHIOPTES

Sambon (1928) remarked that "At first sight, this scale-inhabiting acarion suggested some new kind of Sarcoptoid mite to be placed between the Sarcoptidae . . . and the Analgesidae . . . but, notwithstanding the presence of conspicuous cup-shaped suckers on (the) tarsi, the microscope at once revealed unmistakable Cheyletid characters." The structure of the body and legs show considerable resemblance to that of the Sarcoptiformes. There is, as Sambon remarked, a large sucker or caruncle to each tarsus; and, as occurs in many of the Sarcoptiformes, there are no lateral claws to the empodium. The coxae are weak, and are represented by epimera. There are, however, no genital or adanal suckers. The mouthparts, although highly modified, are in the character of the Trombidiformes. The chelicerae are styliform, and the palpi are modified for clinging. Baker and Wharton (1952), in their textbook of acarology, removed the genus to the family Myobiidae, but commented that it occupied a somewhat intermediate position between the two families. In the Myobiidae, however, the forelegs typically are modified to an appendage for grasping the hairs of the mammalian host; also the tarsus of the legs carries one or two conspicuous claws, and there is no sucker (caruncle). The reduction of the palpi, the lack of tarsal claws to the legs, and the reduction of the coxae, likewise separate *Ophioptes* from the Cheyletidae.

It is apparent that by the standards adopted for classification within the Trombidiformes, that the genus *Ophioptes* is deserving of family status at least, and is therefore allotted to the family Ophioptidae n. fam., within the Prostigmata of the Trombidiformes.

OPHIOPTIDAE n. fam.

Definition: External parasites of Colubrid snakes, producing typically pits in the scales of the host. Chelicerae styliform. Palpi reduced, with a fused genotibia. Coxae of legs reduced to epimera. Developmental stages unknown, apart from a pre-adult pupal stage. With a single genus, *Ophioptes* Sambon 1928, at present known.

REFERENCES

- BAKER, E. W., and WHARTON, C. W., 1952. An Introduction to Acarology. The Macmillan Company, New York. Pp. 1-465 and xiii.
- EWING, H. E., 1933. A New Pit-producing Mite from the Scales of a South American Snake, *J. Parasitol.* **20** (1): 53-56.
- RADFORD, C. D., 1947. Parasitic Mites from Snakes and Rodents (Acarina: Cheyletidae, Linstrophoridae and Laelaptidae), *Proc. Zool. Soc.* **117** (1): 228-240.
- SAMBON, L. W., 1928. *Ophioptes parkeri*. A New Species and Genus of Cheyletid Inhabiting the Scales of Reptiles, *Ann. Trop. Med. & Parasitol.* **22** (1): 137-142.